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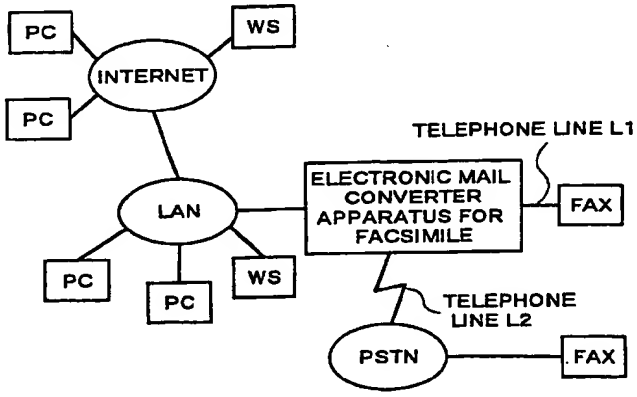
(54) ELECTRONIC MAIL CONVERTER FOR FACSIMILE

(57) An electronic mail converting apparatus for facsimile of the present invention includes connections connecting to a facsimile, a public network, and a LAN, the connections being internally changed over according to the type of data or an instruction, and converting section means for converting data from facsimile data to e-mail data or vice versa, as required, wherein the converted data is transmitted to an instructed destination.

FIG. 2



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Description

Technical Field

The present invention relates to an electronic mail (e-mail) converting apparatus enabling facsimile data to be transmitted to an e-mail address.

Background Art

When a facsimile document is transmitted as an e-mail, it is necessary to have a large scale system, and a special data processing terminal.

Such conventional facsimile communication system includes a one disclosed in Unexamined Published Japanese Patent Application No. 6-164645. FIG. 1 shows its schematic block diagram. In FIG. 1, a facsimile 100 is connected to a host computer 200 to transmit and receive facsimile data over a public network 300. The facsimile 100 and the host computer 200 constitute a facsimile communication system 400. The facsimile communication system 400 connects to a local area network 500 connected to a personal computer, a workstation, a printer server, a file server, and the like.

In the conventional facsimile communication system thus arranged, an operator first places a document to be transmitted on a predetermined position of the facsimile 100, and enters a mail broadcast command, a mail address, and a broadcast address through an operation panel of the facsimile 100. This causes the facsimile 100 to broadcast input data of the transmit document to the instructed broadcast address, and to direct the host computer 200 to transmit an e-mail the instructed e-mail address. The host computer 200 transmits the transmit document data as an e-mail to the instructed e-mail address according to the instruction from the facsimile 100.

However, the above facsimile communication system is necessary to arrange a special computer interface between the facsimile and the host computer, an data-processing terminal. In addition, there is a problem that, when an e-mail address is entered, it must be entered through a specific data-processing terminal. Moreover, when facsimile data is converted into an e-mail format, it is necessary to use a specific host computer or data-processing terminal. Furthermore, there are problems in selection of a sender, saving of receiving paper, and privacy protection of the transmit document. Accordingly, it is difficult at present to transmit a facsimile document as an e-mail by utilizing the existing facsimile.

Disclosure of the Invention

The present invention is made in view of the above problems, and intended to provide an electronic mail converting apparatus for facsimile which can be switched between facsimile transmission of a facsimile document and e-mail transmission of a facsimile document to an e-mail address, by using an existing facsimile.

The present invention provides an electronic mail converting apparatus for facsimile comprising connections connecting to a facsimile, a public network, and a LAN, the connections being internally changed over according to the type of data or an instruction, and converting section means for converting data from facsimile data to e-mail data or vice versa, as required, wherein the converted data is transmitted to an instructed destination.

According to the configuration of the present invention, it is possible to easily change over between facsimile transmission of a facsimile document and e-mail transmission of a facsimile document by using an existing facsimile, or without using a specific data-processing terminal or computer interface. In addition, according to this configuration, it is possible to convert stored facsimile data into an e-mail format, and to convert a telephone number into an e-mail address, whereby transmitting the data converted into the e-mail format to the address of e-mail.

Brief Description of the Drawings

FIG. 1 is a schematic diagram showing a conventional apparatus system for transmitting a facsimile document as an e-mail;

FIG. 2 is a schematic diagram showing a configuration of an electronic mail converting apparatus for facsimile of the present invention;

FIG. 3 is a basic block diagram of the electronic mail converting apparatus for facsimile shown in FIG. 2;

FIG. 4 is a flowchart when facsimile data is transmitted to an e-mail address;

FIG. 5 is a flowchart when a correspondence table of telephone numbers and e-mail addresses is recognized from data and stored;

FIG. 6 is a correspondence table of telephone numbers and e-mail addresses;

FIG. 7 is a block diagram of a device for receiving an e-mail, converting e-mail data into facsimile data, and transmitting it over a telephone line;

FIG. 8 is a flowchart when e-mail data is converted into and transmitted as facsimile data;

FIG. 9 is a block diagram of a device for converting e-mail data into facsimile data, and transmitting it over a telephone line;

FIG. 10 is a flowchart when a direct inward telephone number transmitted over a telephone line is recognized, and facsimile data is transmitted to an e-mail address corresponding to the direct inward telephone number;

FIG. 11 is a format of an e-mail address book;

FIG. 12 is a flowchart when an e-mail is output through an address listed in the e-mail address

book;

FIG. 13 is a flowchart when an e-mail is not output through an address listed in the e-mail address book;

FIG. 14 is a flowchart when output exceeding a prescribed number of sheets is controlled;

FIG. 15 is a flowchart when output exceeding a prescribed number of sheets is transferred to another line;

FIG. 16 is a table showing correspondence between e-mail addresses of a transmitting party and encryption keys;

FIG. 17 is a table showing correspondence between e-mail addresses of a receiving party and encryption keys;

FIG. 18 is a flowchart when an encryption e-mail is transmitted; and

FIG. 19 is a flowchart when an encryption e-mail is received.

Best Mode for carrying Out the Invention

Now, detailed description is given on an embodiment of an electronic mail converting apparatus for facsimile of the present invention by referring to the drawings. FIG. 2 shows environment where the electronic mail converting apparatus for facsimile of the present invention operates. The electronic mail converting apparatus for facsimile of the present invention provides an interface with a telephone line and an interface with a LAN. The LAN interface assumes environment where an e-mail can be utilized. In addition, protocol of the LAN is to be Ethernet, but any other protocol may be used.

FIG. 3 is a schematic diagram showing the basic configuration of the apparatus according to the present invention. A CPU 1 is control means for controlling the entire apparatus, and performs predetermined control operations under various programs stored in a ROM 2. In addition, a RAM 3 is used as a memory for program data.

A switch 4 has a function for switching between a telephone line L1 and a telephone line L2. A switching portion 5 enables it to switch the telephone line L1 to a facsimile apparatus 6 and the telephone line L2. In addition, the switch 4 has a function for switching between the telephone line L1 or L2, and an internal LAN.

A LAN controlling section 7 transmits and receives an e-mail through the LAN. An e-mail format converting section 8 converts facsimile data received over the telephone line L1 into an e-mail format. Accordingly, it is arranged that the facsimile data received over the telephone line L1 is converted into a predetermined format by the e-mail format converting section 8, and the converted data is transmitted to the LAN by the LAN controlling section 7.

A hard disk (HD) 9 is an auxiliary storage for storing the facsimile data and e-mails. The HD 9 is also used for storing a correspondence table of e-mail addresses and telephone numbers. In addition, a modem 10 is a device for modulating and demodulating the data transmitted and received between the telephone line L1 or L2, and the LAN.

FIG. 4 is a flowchart when the facsimile data is transmitted to an e-mail address. First, an operator places a transmit document on a predetermined position of the facsimile apparatus 6, and enters a telephone number through an operation panel of the facsimile apparatus 6. Then, the data is received by the converting apparatus over the telephone line L1.

When data on the destination telephone number is transmitted to the converting apparatus over the telephone line L1, the switch 4 recognizes the telephone number (S 11), and determines whether the data of telephone number and subsequent facsimile data are stored in the converting apparatus, or transmitted over the telephone line L2 (S 12). Then, the determination causes the switch 4 to change over the state through the switching portion 5 between sending the data to the telephone lines L1 and L2, and sending data to the LAN.

When the switch 4 determines to store the facsimile data in the converting apparatus, the e-mail format converting section 8 converts the facsimile data into the e-mail format (S 13). Then, the e-mail format converting section 8 converts the telephone number into an e-mail address according to the correspondence table of the telephone numbers and e-mail addresses previously stored in the HD 9 (S 14). Thereafter, the LAN controlling section 7 transmits the data converted into the e-mail format to the converted e-mail address (S 15). In the transmission, the modem 10 modulates the data.

Here, the e-mail format is the facsimile data converted into the TIFF format (format for managing an image with a personal computer), and appended with an MIME header (format for transmitting and receiving data other than text in an e-mail).

On the other hand, when the switch 4 determines not to store the facsimile data in the converting apparatus, it changes over the switching portion 5 to transmit the facsimile data over the telephone line L2 (S 16).

As described above, according to the converting apparatus, it is possible to perform communication with the LAN only through connection with the facsimile, so that e-mail communication can be attained by utilizing the LAN. That is, without specially providing a computer interface between the facsimile and an information terminal, it is possible by utilizing an existing facsimile apparatus to store the facsimile data received from the locally attached telephone line L1, to transmit it over the telephone line L2 which is PSTN (public switched telephone network), or to transmit it to an e-mail address attached to the LAN or Internet.

The correspondence table of e-mail addresses and destination telephone numbers is stored in the HD 9 as shown in FIG. 5. That is, the LAN controlling section 7 receives an e-mail containing the data of the corre-

spondence table of e-mail addresses and telephone numbers shown in FIG. 6 through the LAN (S 21), and takes out the data part from the e-mail (S 22). Then, the LAN controlling section 7 recognizes the data of correspondence table from the data part of the e-mail (S 23), and stores the data of correspondence table in the HD 9 (S 24).

Storage of the correspondence table of telephone numbers and e-mail addresses enables it to transmit the facsimile data to an e-mail address according to the correspondence table, or to transmit the received e-mail data to the facsimile.

FIG. 7 is a schematic block diagram of a converting apparatus that receives an e-mail, reversely converts the e-mail data into facsimile data, and transmits it over the telephone line L1 or L2. Here, in FIG. 7, parts same as those in FIG. 3 are identified by the same reference numerals, and description on them is omitted.

In FIG. 7, an e-mail format reverse converting section 11 converts data in the e-mail format into facsimile data. Accordingly, it is arranged that the e-mail format reverse converting section 11 converts the data in the e-mail format into the facsimile data, and it is transmitted over the telephone line L1 or L2 through changing-over of the switching portion 5 in the switch 4. A panel controlling section 12 serves to send signals from a ten-key 13 with which the operator performs the input operation to the CPU 1.

FIG. 8 is a flowchart when the converting apparatus shown in FIG. 7 receives an e-mail, converts it from the e-mail data to the facsimile data, and transmits the converted facsimile data. First, when the operator transmits an e-mail, the LAN controlling section 7 receives it through the LAN (S 31), and takes out the data part of the e-mail (S 32). Then, the LAN controlling section 7 takes out an indication command for the text in the data part of the e-mail (S 33).

Then, the LAN controlling section 7 determines whether the indication command for the text of the e-mail is PRINT or RELAY (S 34). In this case, if the indication command for the text of the e-mail is PRINT, it is transmitted over the telephone line L1. If the indication command is RELAY, it is transmitted over the telephone line L2. When transmission is performed over the telephone line L1 or L2, the e-mail format reverse converting section 11 converts the data in the e-mail format into the facsimile data. Then, the thus converted facsimile data is transmitted over the telephone line L1 or L2 according to the indication command (S 35, S 36).

With such arrangement, the e-mail data can be transmitted to the existing facsimile by converting the received e-mail data into the facsimile data without need for a special computer interface between an information terminal and a specific facsimile apparatus. In addition, it becomes possible to utilize the existing facsimile as a network printer by transmitting the content of the e-mail to the existing facsimile connected to the telephone line L1.

FIG. 9 is a schematic block diagram of a converting apparatus that, similar to the converting apparatus of FIG. 7, receives an e-mail, reversely converts e-mail data into facsimile data, and transmits it over the telephone line L1 or L2. Here, in FIG. 9, parts same as those in FIG. 3 are identified by the same reference numerals, and description on them is omitted.

In FIG. 9, an direct inward number recognizing section 14 recognizes a direct inward number transmitted over the public network through the telephone line L2. Accordingly, the switch 4 recognizes the sent direct inward number received from the public network, and changes over the switching portion 5 so that it is received in the converting apparatus through the telephone line L2. Then, the direct inward number recognizing section 14 recognizes the direct inward number.

FIG. 10 is a flowchart when the converting apparatus shown in FIG. 9 recognizes the sent direct inward telephone number transmitted over the telephone line L2, and transmits facsimile data to an e-mail address corresponding to the direct inward number. First, when the operator transmits the direct inward number and the facsimile data, the switch 4 changes over the switching portion 5 to the telephone line L2, whereby the converting apparatus receives the direct inward number and the facsimile data over the public network through the telephone line L2. In this case, the direct inward number recognizing section 14 recognizes the received direct inward number (S 41).

Then, the e-mail format converting section 8 converts the direct inward number into the e-mail address according to the correspondence table of direct inward numbers and e-mail addresses previously stored in the HD 9 (S 42). Subsequently, the e-mail format converting section 8 converts facsimile data following the direct inward number into the e-mail format (S 43). Thereafter, the LAN controlling section 7 transmits the facsimile data converted into the e-mail format to the converted e-mail address (S 44). Here, similar to the above, the e-mail format is the facsimile data converted into the TIFF format, and appended with an MIME header.

As described, according to the converting apparatus, it is possible to recognize a direct inward telephone number transmitted over the telephone line L2 through the public network, to convert the facsimile data into the e-mail format, and to transmit the converted facsimile data to an e-mail address corresponding to the direct inward number.

Now, description is given on a case where an e-mail is output to the facsimile apparatus when an e-mail address of a sender is recognized, and collated with an e-mail address in the e-mail address book.

When the converting apparatus receives an e-mail containing an e-mail address list shown in FIG. 11, for example, when it recognizes that the header information (From) of the e-mail is master, and its Subject is !I$list, the text of the e-mail or the e-mail address list is stored in the RAM 3 and the HD 9 as an e-mail address book.

The e-mail is output to the facsimile apparatus by using the e-mail address book and the above-mentioned correspondence table.

Here, the e-mail address book is created by defining and obtaining character strings such as "master" or "!!$list" which is never used as an ordinary e-mail address. Thus, it is possible to transmit the e-mail as the facsimile data by using the header information of e-mail, without inherent processing.

Now, the above operation is described by referring to the flowchart shown in FIG. 12, and FIG. 7. When the LAN controlling section 7 receives an e-mail while the HD 9 contains the e-mail address book, it takes out the e-mail address of the sender from the header information (From) of the e-mail (S 51). Then, the taken out e-mail address is collated with the e-mail address book (S 52). If the same address is found in the e-mail address book, the e-mail format reverse converting section 11 converts the text of the e-mail into facsimile data, and transmits it to a telephone number corresponding to the e-mail address according to the correspondence table stored in the HD 9 (S 53). In this case, the switch 4 appropriately changes over the switching portion 5 depending on the destination telephone number to select the telephone line L1 or L2.

According to such arrangement, since only senders from whom e-mails are desired to be received can be previously registered, it is possible to prevent reception of a mischief facsimile message or a facsimile message that is indiscriminately transmitted.

Now, a case is described where an e-mail is not received from an address listed in an e-mail address book. Again, the description is given by referring to FIG. 7. FIG. 13 is a flowchart in this case. First, when the LAN controlling section 7 receives an e-mail, it takes out the e-mail address of the sender from the header information (From) of the e-mail (S 61). Then, the taken out e-mail address is collated with the e-mail address book (S 62). If the same address is not found in the e-mail address book, the e-mail format reverse converting section 11 converts the text of the e-mail into facsimile data, and transmits it to a telephone number corresponding to the e-mail address according to the correspondence table stored in the HD 9 (S 63). In this case, the switch 4 appropriately changes over the switching portion 5 depending on the destination telephone number to select the telephone line L1 or L2.

In this case, an e-mail address is stored in the HD 9, and, when the ten-key 13 is pressed (S 64), added to the e-mail address book, which is then used as a new address book (S 65).

According to such arrangement, since it is possible to previously register senders from whom e-mails are not desired to be received, it is possible to prevent a mischief facsimile message from specific senders. Even if a mischief facsimile message is received, such sender can be rapidly registered.

Now, a case is described where an e-mail is output at or less than the maximum output number of sheets of the facsimile by referring to the flowchart of FIG. 14 and FIG. 7.

When the converting apparatus receives at the LAN controlling section 7 an e-mail containing data at the maximum output number of sheets, for example, when it recognizes that the header information (From) of the e-mail is master, and the Subject is !!$pmax, the text of the e-mail is stored in the RAM 3 and the HD 9 as the maximum output number of sheets. It is determined from the maximum output number of sheets and the number of sheets of the e-mail whether or not the e-mail is output to the facsimile.

First, when the LAN controlling section 7 receives an e-mail while the HD 9 contains data at the maximum output number of sheets, it takes out the number of sheets of the e-mail (S 71), and compares the content of the tag of the text of the e-mail in the TIFF structure (Page Number) with the maximum output number of sheets. If the content of the tag (Page Number) is larger than the maximum output number of sheets, it waits for pressing of the ten-key 13 (S 73). When key 1 is pressed, it means that the number of sheets of the e-mail exceeds the maximum output number of sheets of the facsimile. Then, the e-mail format reverse converting section 11 converts the text of the e-mail into facsimile data, and transmits the facsimile data to a telephone number corresponding to the e-mail address according to the correspondence table stored in the HD 9 (S 74). In this case, the switch 4 appropriately changes over the switching portion 5 depending on the destination telephone number to select the telephone line L1 or L2. If a key other than key 1 is pressed, the e-mail is not converted into the facsimile data, and transmitted to the facsimile.

On the other hand, if the content of the tag (Page Number) is smaller than the maximum output number of sheets, the e-mail format reverse converting section 11 converts the text of the e-mail into facsimile data, and transmits the facsimile data to a telephone number corresponding to the e-mail address according to the correspondence table stored in the HD 9 (S 74).

According to such arrangement, it is possible to save number of print paper in the LAN attached facsimile where the paper cost is higher than the communication cost.

Now, a case is described where, when the number of sheets of an e-mail exceeds the maximum output number of sheets, the e-mail is transferred to another e-mail address by referring to the flowchart of FIG. 15 and FIG. 7.

When the LAN controlling section 7 receives an e-mail containing an e-mail address for transfer, for example, when it recognizes that the header information (From) of the e-mail is master, and its Subject is !!$trn, the text of the e-mail or the e-mail address for transfer is stored in the RAM 3 and the HD 9 as the e-mail address for transfer. When the number of sheets of the e-mail

exceeds the maximum output number of sheets of the facsimile, the e-mail is transferred to the e-mail address for transfer.

When the LAN controlling section 7 receives an e-mail, it takes out the content of the tag of the text of the e-mail in the TIFF structure (Page Number) (S 81), and determines from the content of the tag and the maximum output number of sheets stored in the HD9 as described above whether or not the e-mail is transferred to the e-mail address for transfer (S 82). When the content of the tag (Page Number) is larger than the maximum output number of sheets, the LAN controlling section 7 transfers the text of the e-mail to the e-mail address for transfer (S 83).

On the other hand, when the content of the tag (Page Number) is smaller than the maximum output number of sheets, the e-mail format reverse converting section 11 converts the text of the e-mail into facsimile data, and transmits the facsimile data to a telephone number corresponding to the e-mail address according to the correspondence table stored in the HD 9 (S 84).

In this arrangement, it is possible to transmit the e-mail to a predetermined e-mail address for transfer even if the content of the tag does not exceed the maximum output number of sheets. This enables it to previously view the content of received documents in mass on a display of a PC, so that the number of sheets of paper can be saved.

Now, description is given on a case where facsimile data is transmitted as an e-mail, and where data of an e-mail is transmitted to a facsimile apparatus by referring to FIG.s 16 through 19 and FIG. 7.

When the converting apparatus receives in the LAN controlling section 7 an e-mail containing an encryption key table for it and an encryption key table for the other party, for example, when it recognizes that the header information (From) of the e-mail is master, and its Subject is !!$myciph, the text of the e-mail is defined as the encryption key table for it shown in FIG. 16. Further, for example, when it recognizes that the header information (From) of the e-mail is master, and its Subject is !!yourciph, the text of the e-mail or the encryption key table for the other party is stored in the RAM 3 and the HD 9, and is defined as the encryption key table for the other party shown in FIG. 17.

FIG. 18 is a flowchart when an encrypted e-mail is transmitted. First, when the operator places a transmit document on a predetermined position of the facsimile apparatus 6, and enters an telephone number through the operation panel of the facsimile apparatus 6, its data is received by the apparatus through the telephone line L1. If, for example, the telephone number transmitted over the telephone line L1 is #123*890, the destination 123 to which the e-mail is transmitted is taken out from telephone numbers stored in the HD 9 (S 91), and the transmission requester is identified from the telephone number (S 92).

Then, a private key corresponding to 890 in the public encryption key system is taken out from the own encryption key table stored in the HD 9 shown in FIG. 16 (S 93). Subsequently, a secret key corresponding to 123 in the secret key system is taken out from the encryption key table for the other party stored in the HD 9 shown in FIG. 17 (S 94).

Then, a so-called digest is created by digitizing the facsimile data transmitted following the sent telephone number under a predetermined rule (S 95). The digest is used for checking whether or not the content is tempered as it is received. The digest is then encrypted by the private key (S 96). Then, it is determined whether or not the facsimile data is encrypted (S 97).

If it is encrypted, the facsimile data is encrypted by the secret key that is taken out (S 98). The e-mail format converting section 8 converts the encrypted facsimile data into the e-mail format together with associated data, and the LAN controlling section 7 transmits the facsimile data converted into the e-mail format to the destination corresponding to the secret key as an e-mail (S 99). On the other hand, if the facsimile data is not encrypted, the e-mail format converting section 8 converts the facsimile data into the e-mail format together with associated data, and the LAN controlling section 7 transmits the facsimile data converted into the e-mail format to the destination corresponding to the secret key (S 99).

FIG. 19 is a flowchart when an encrypted e-mail is received. First, when the operator receives an e-mail, the data is entered into the LAN controlling section 7 of the converting apparatus. In this case, an e-mail address is taken out from the header information (From) of the e-mail (S 101), and a corresponding public key in the public key system and a secret key in the secret key system are taken out from the encryption key table for the other party (S 102).

Then, it is determined whether or not the text of the e-mail is encrypted (S 103). If it is encrypted, the text body is decrypted by the secret key (S 104).

Subsequently, a digest A is created by digitizing the facsimile data under a predetermined rule (S 105). In addition, a digest B is created by decrypting an attached digest with a public key (S 106). On the other hand, if the e-mail is not encrypted, a digest A is created by digitizing the text as it is under the predetermined rule (S 105), and a digest B is created by decrypting an attached digest with a public key (S 106).

Then, it is determined whether or not the digests A and B match by comparing them (S 107). If both digests match, the e-mail format reverse converting section 11 converts the text of the e-mail into facsimile data, and outputs the converted facsimile data to the facsimile (S 108).

In the above, the private key, the secret key, and the public key shown in FIG.s 16 and 17 correspond to specific telephone numbers and e-mail addresses, respectively. In addition, although, in the above, integrity is checked for the contents of the facsimile data before

encryption and the data of the decrypted e-mail, it may be checked for the contents of encrypted data and data before decryption.

According to the above arrangement, it is possible to perform operation only to output a document assured for safety even in a network environment where security is critical.

Although the above embodiment is described for a case where one LAN and two telephone lines L1, L2 are attached to the converting apparatus, the present invention is not limited to such arrangement. It may be applied to an environment having two or more LANs and one or more than two telephone lines attached if it is allowed to transmit and receive data in a predetermined format to and from a specified destination through data conversion between a network transmitting and receiving data based on an e-mail address, and a network transmitting and receiving data based on a telephone number.

As described above, the electronic mail converting apparatus for facsimile according to the present invention can change over between a telephone line and a LAN therein under an instruction, convert data from facsimile data to e-mail data or vice versa, as required, with converting section means, and transmit the converted data to a specified destination. Therefore, it is possible to change over transmission of a facsimile document between facsimile transmission and e-mail transmission by using an existing facsimile, without a specific interface.

Industrial Applicability

The electronic mail converting apparatus for facsimile according to the present invention is suitable in transmission and reception of facsimile data and/or e-mail data between a public network or a facsimile and a LAN by using an existing facsimile apparatus.

Claims

1. An electronic mail converting apparatus for facsimile comprising recognizing section means for recognizing whether data is transmitted by a facsimile, a public network, or a LAN, and a transferring means for converting said data into a predetermined format, as required, and transferring the data to any of the facsimile, the public network, or the LAN.

2. The apparatus according to claim 1 further comprising converting section means for converting data received from the facsimile into a format of e-mail, thereby transmitting the converted data as an e-mail.

3. The apparatus according to claim 1 further comprising converting section means for converting data received over the telephone line into a format of e-mail, thereby transmitting the converted data as an e-mail.

4. The apparatus according to claim 1 further comprising determination means for determining whether the e-mail data is output from the facsimile or the public network, and converting section means for converting said e-mail data into a format of facsimile, thereby outputting the converted data based on said determination.

5. The apparatus according to claim 1, wherein the maximum number of sheets that can be output from the facsimile or the public network is stored therein.

6. The apparatus according to claim 5, wherein the number of sheets of document in an e-mail is recognized, said maximum number of sheets being compared with the number of sheets of document, if the number of sheets of document being larger than said maximum number of sheets, transmission of the e-mail being temporarily held, thereby the state of operation being turned to an operator call state.

7. The apparatus according to claim 5, wherein the number of sheets of document in an e-mail is recognized, said maximum number of sheets being compared with the number of sheets of document, if the number of sheets of document being larger than said maximum number of sheets, the e-mail being transferred.

8. An electronic mail converting apparatus for facsimile receiving data attached to a telephone number or data attached to an e-mail address, converting said data into a predetermined format, as required, and transmitting said data to a instructed telephone number of an e-mail address.

9. The apparatus according to claim 8, wherein a data attached to a telephone number is converted into a data attached to a destination e-mail address.

10. The apparatus according to claim 8, wherein a data attached to a e-mail address is converted into data attached to a destination telephone number.

11. The apparatus according to claim 8, wherein a correspondence table or e-mail addresses and telephone numbers is stored therein.

12. The apparatus according to claim 8, wherein an e-mail address book including a plurality of e-mail addresses is stored therein.

13. The apparatus according to claim 12 further comprising means for recognizing an e-mail address,

and collating said address with e-mail addresses in said e-mail address book, wherein when said address exists in said e-mail address book, said e-mail is converted into facsimile data, as required, and transmitted to the facsimile or the public network.

14. The apparatus according to claim 13 further comprising means for recognizing an e-mail address, and collating said address with e-mail addresses in said e-mail address book, wherein when said address does not exist in said e-mail address book, said e-mail is converted into facsimile data, as required, and transmitted to the facsimile or the public network.

15. The apparatus according to claim 14, wherein said address is added to said e-mail address book.

16. The apparatus according to claim 8, wherein data attached to a telephone number is encrypted by a key corresponding to a specific telephone number and an e-mail address, said data being converted into the e-mail format, and transmitted to an e-mail address.

17. The apparatus according to claim 16, wherein data in the e-mail format is decrypted by said key, said data being converted into facsimile data and transmitted to a facsimile or public network.

18. The apparatus according to claim 17, wherein said data attached to a telephone number is transmitted to a facsimile or public network only when it matches said data in the e-mail format.

FIG. 1

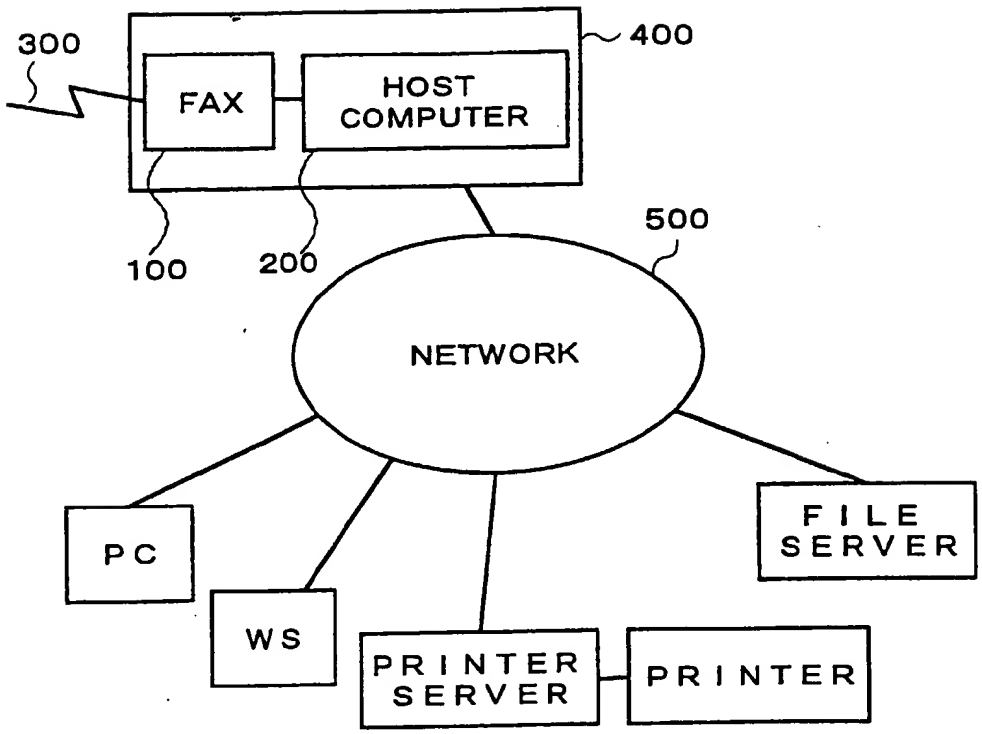


FIG. 2

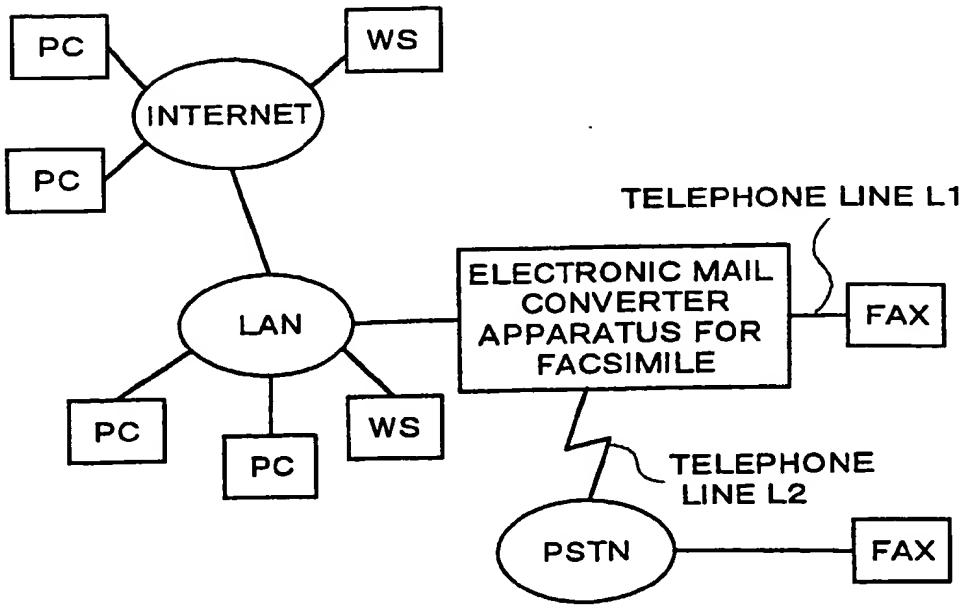


FIG. 3

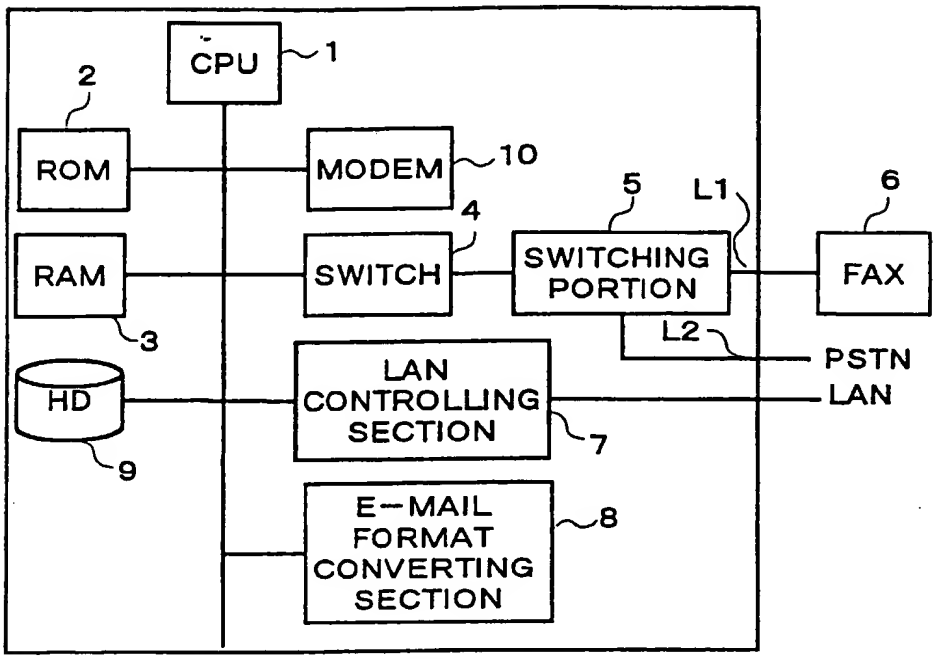

CPU
1
2
ROM
MODEM
10
5
L1
6
4
RAM
SWITCH
SWITCHING PORTION
FAX
3
L2
PSTN
HD
LAN CONTROLLING SECTION
LAN
7
9
E-MAIL FORMAT CONVERTING SECTION
8

FIG. 4

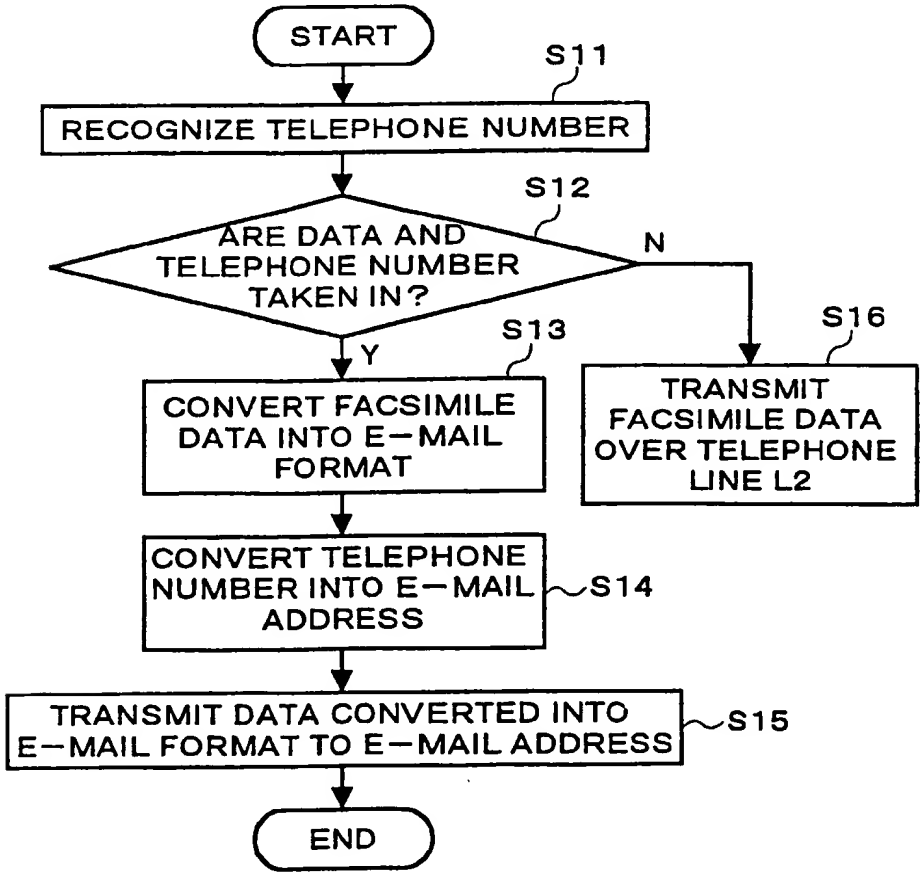

START
S11
RECOGNIZE TELEPHONE NUMBER
S12
ARE DATA AND TELEPHONE NUMBER TAKEN IN?
N
Y
S13
S16
CONVERT FACSIMILE DATA INTO E-MAIL FORMAT
TRANSMIT FACSIMILE DATA OVER TELEPHONE LINE L2
CONVERT TELEPHONE NUMBER INTO E-MAIL ADDRESS
S14
TRANSMIT DATA CONVERTED INTO E-MAIL FORMAT TO E-MAIL ADDRESS
S15
END

FIG. 5

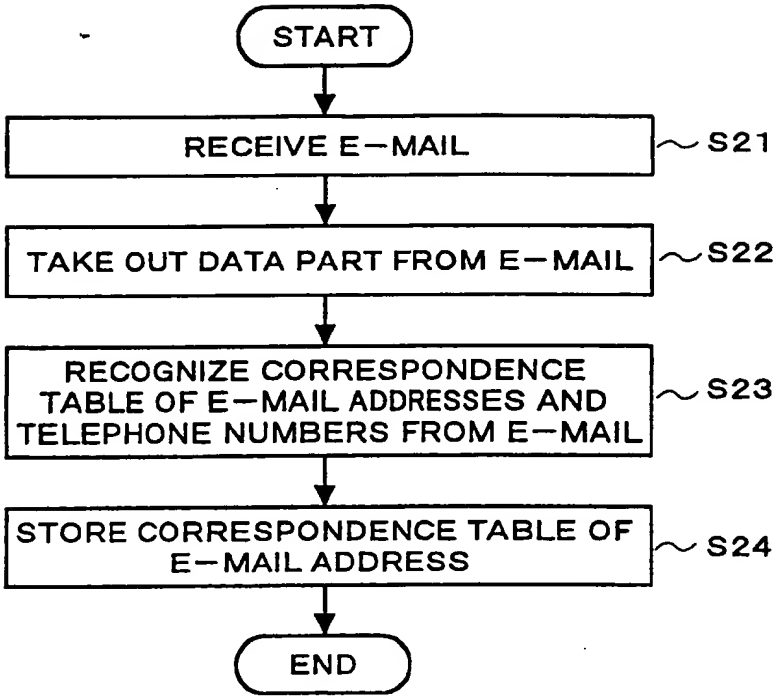


FIG. 6

DESTIATION TELEPHONE NUMBER	DESTINATION E−MAIL ADDRESS
#1	todd@abc. com
#2	panafax@mgos. mei. co. jp
. . . . .	. . . . .
#999	aaa@aaaaaaaaa

FIG. 7

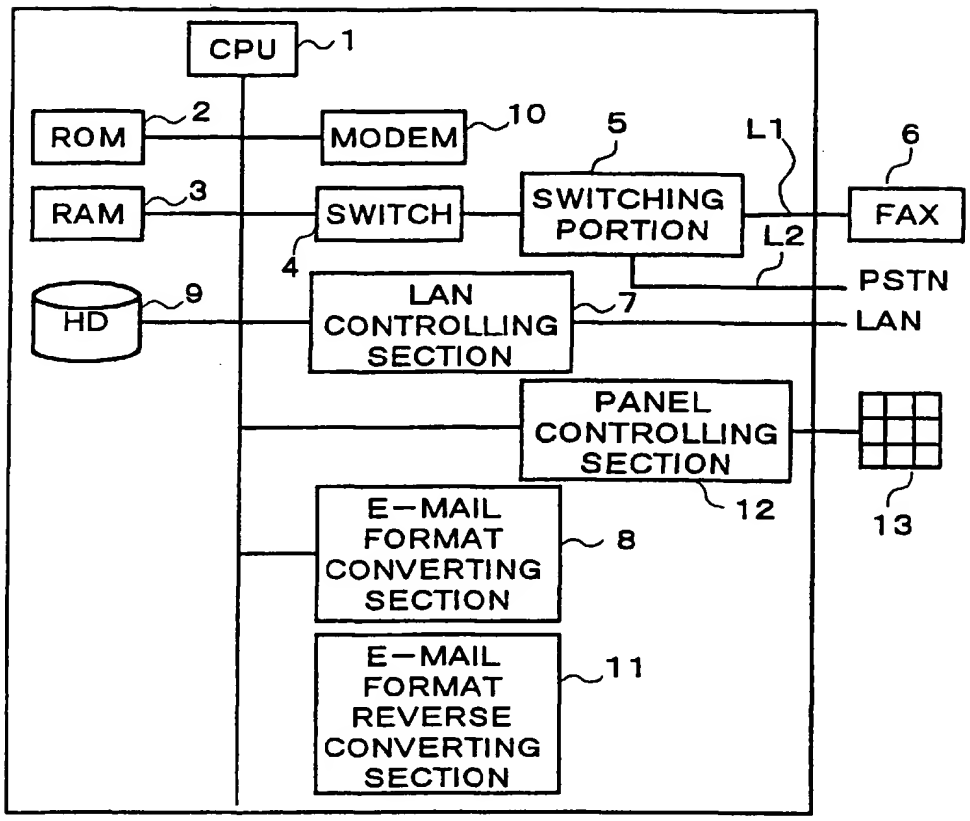

CPU
1
ROM
2
MODEM
10
5
L1
6
RAM
3
SWITCH
SWITCHING PORTION
FAX
4
L2
PSTN
HD
9
LAN CONTROLLING SECTION
7
LAN
PANEL CONTROLLING SECTION
12
13
E-MAIL FORMAT CONVERTING SECTION
8
E-MAIL FORMAT REVERSE CONVERTING SECTION
11

FIG. 8

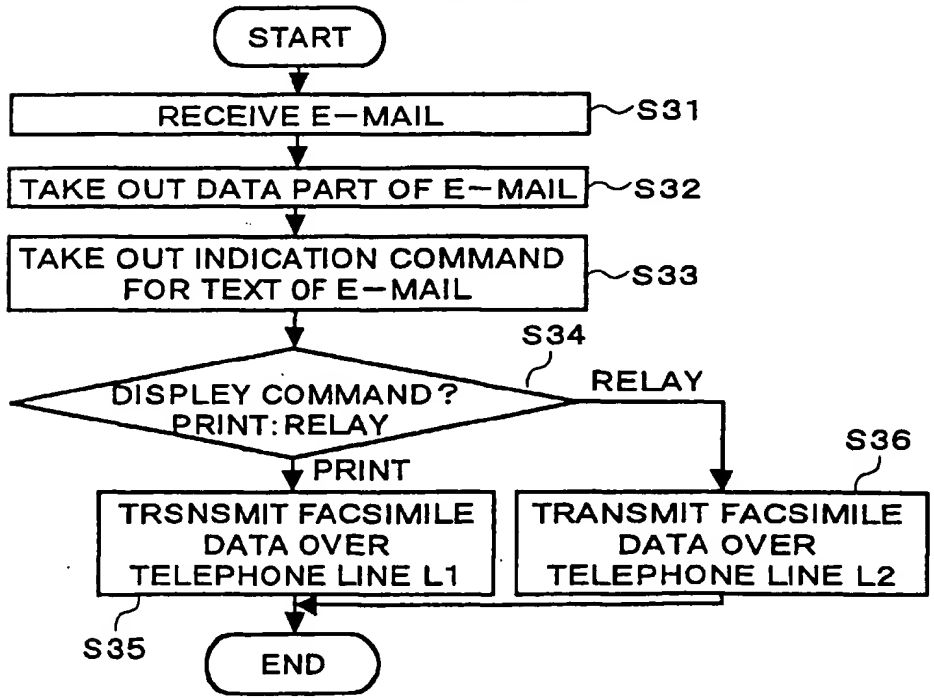

START
RECEIVE E-MAIL
S31
TAKE OUT DATA PART OF E-MAIL
S32
TAKE OUT INDICATION COMMAND FOR TEXT OF E-MAIL
S33
S34
DISPLEY COMMAND? PRINT: RELAY
RELAY
PRINT
S36
TRSNSMIT FACSIMILE DATA OVER TELEPHONE LINE L1
TRANSMIT FACSIMILE DATA OVER TELEPHONE LINE L2
S35
END

FIG. 9

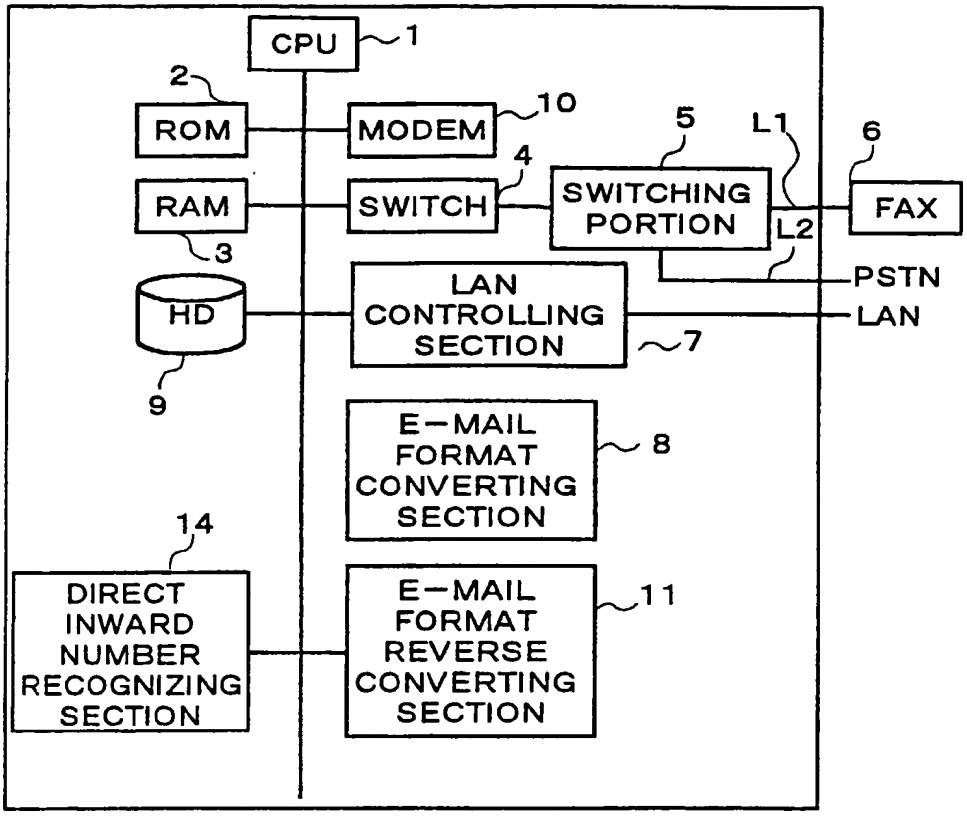


FIG. 10

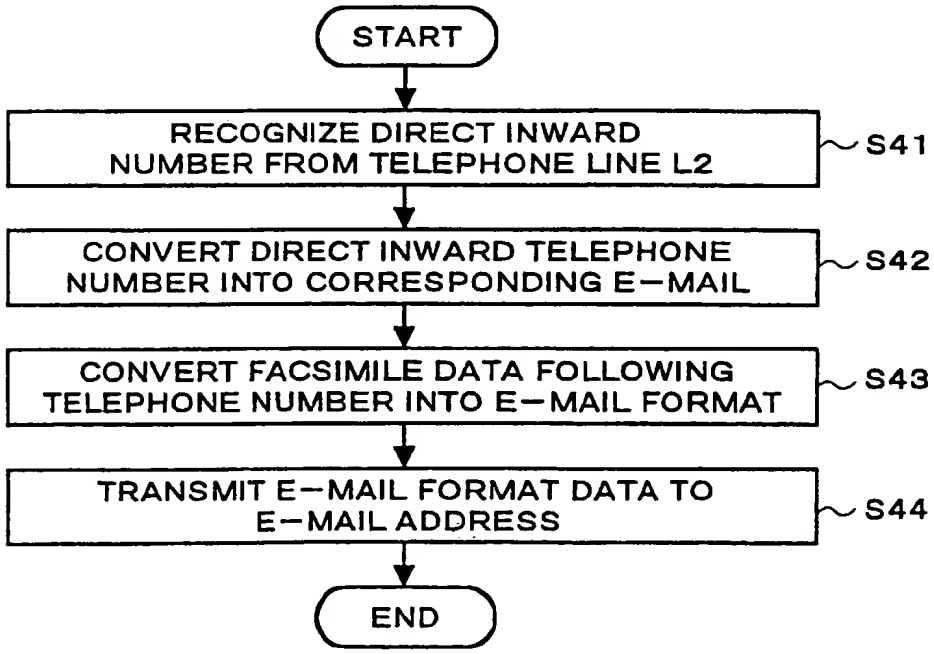


FIG. 11

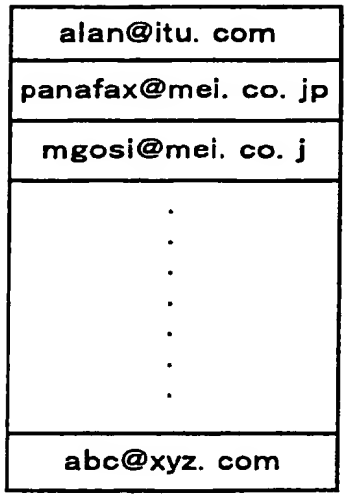


FIG. 12

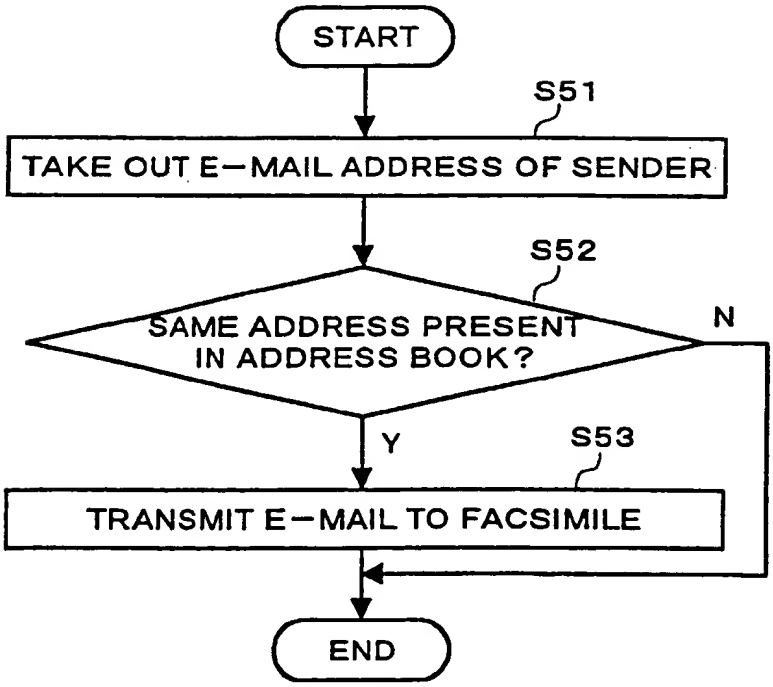


FIG. 13

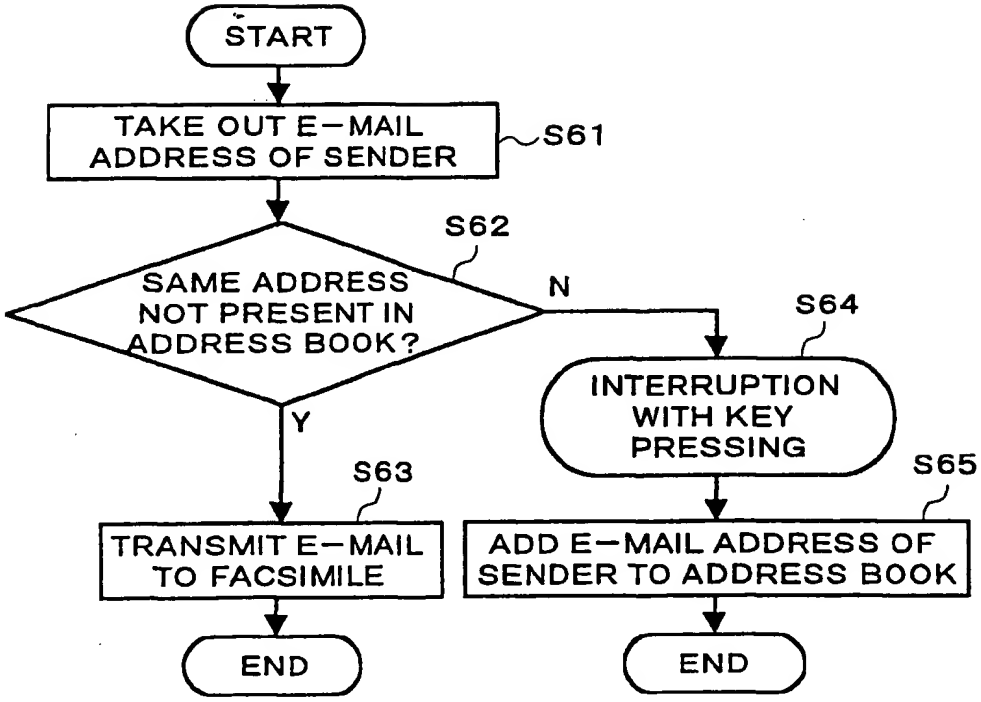


FIG. 14

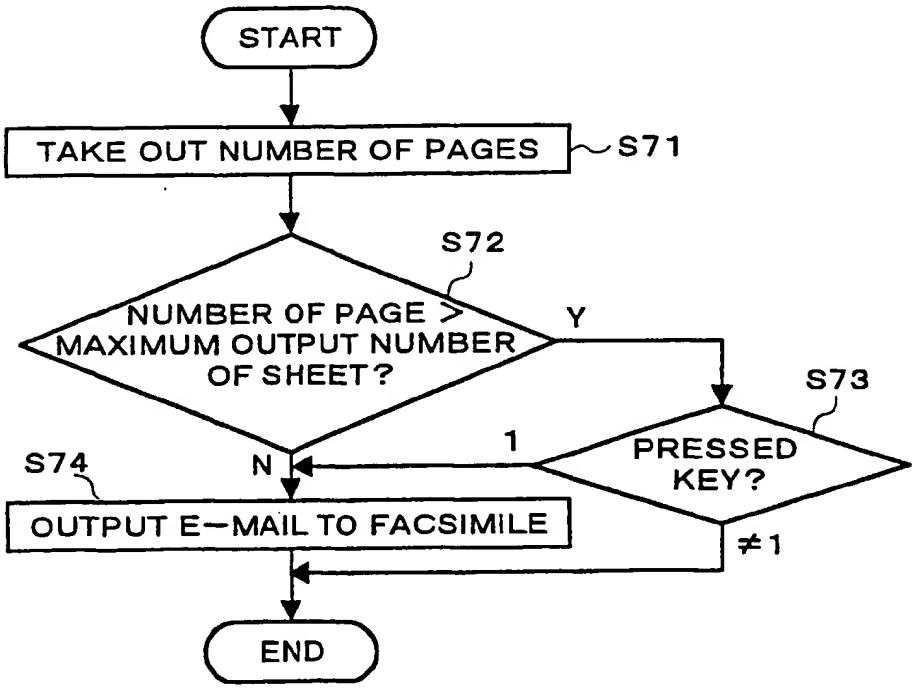


FIG. 15

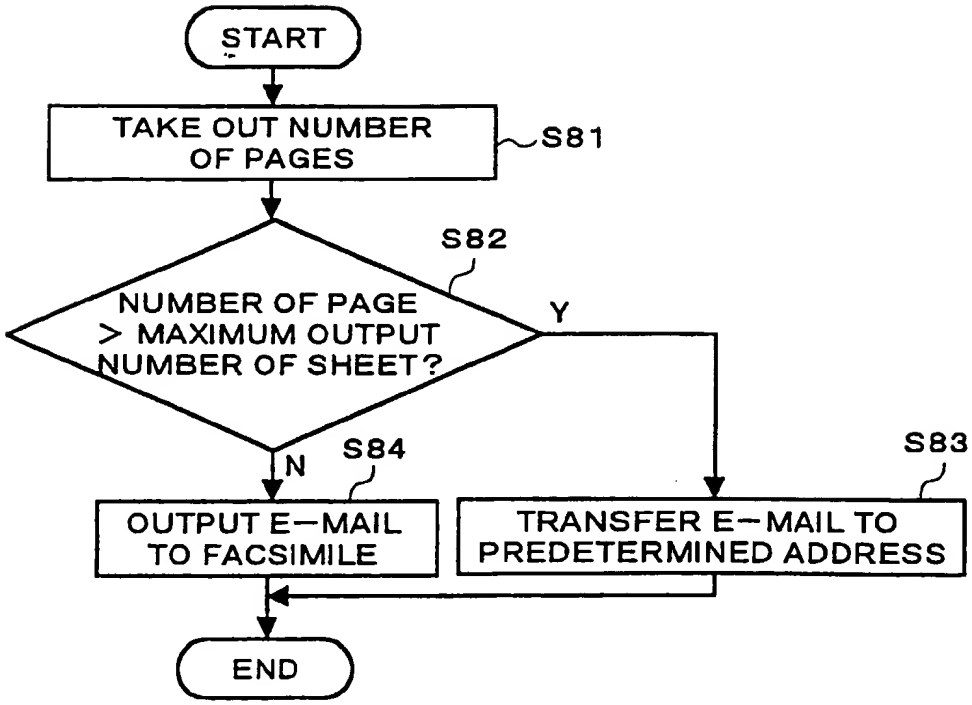


FIG. 16

NUMBER	E-MAIL ADDRESS	PRIVATE KEY
001	a10@mei. co. jp	10
890	a20@mei. co. jp	20
.	.	.
.	.	.
.	.	.
.	.	.
.	.	.
.	.	.
.	.	.
.	.	.
999	a99@mei. co. jp	99

FIG. 17

NUMBER	E-MAIL ADDRESS	PUBLIC KEY	SECRET KEY
000	abc@USA. com	8000	9000
123	aaa@USA. com	8123	9123
. . . . .	. . . . .	. . . . .	. . . . .
888	XXX@USA. com	8888	9888

FIG. 18

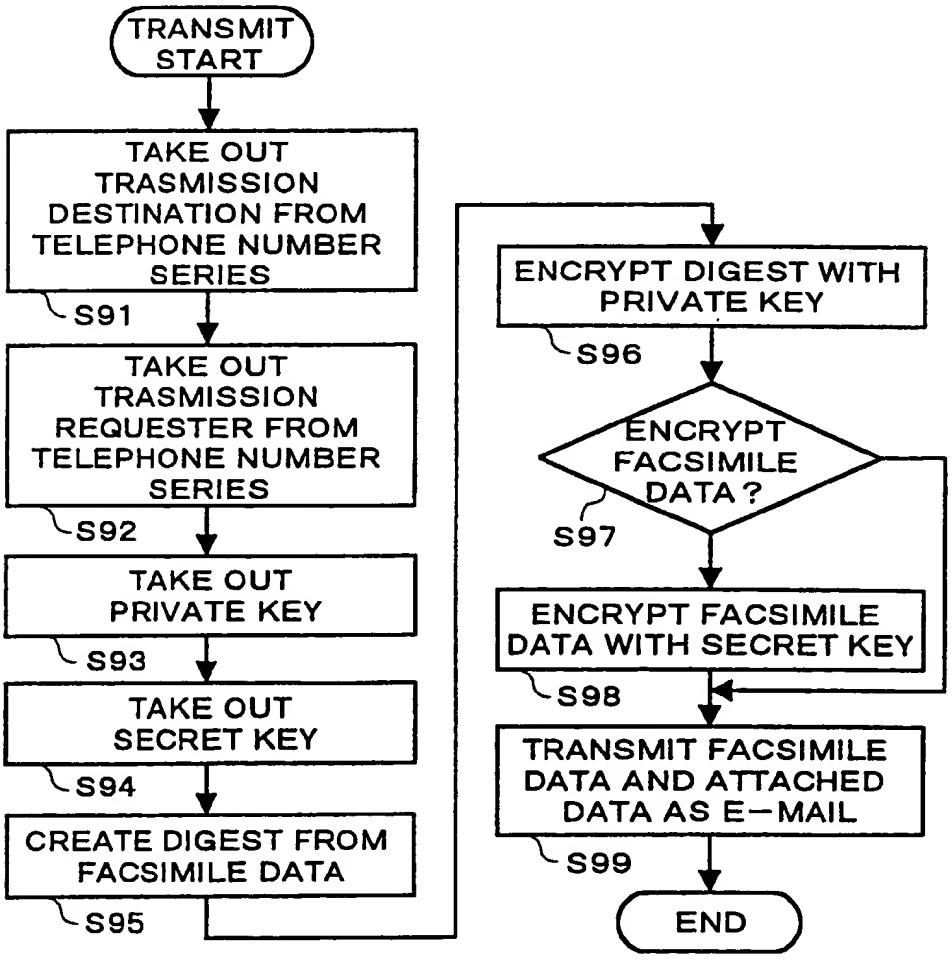
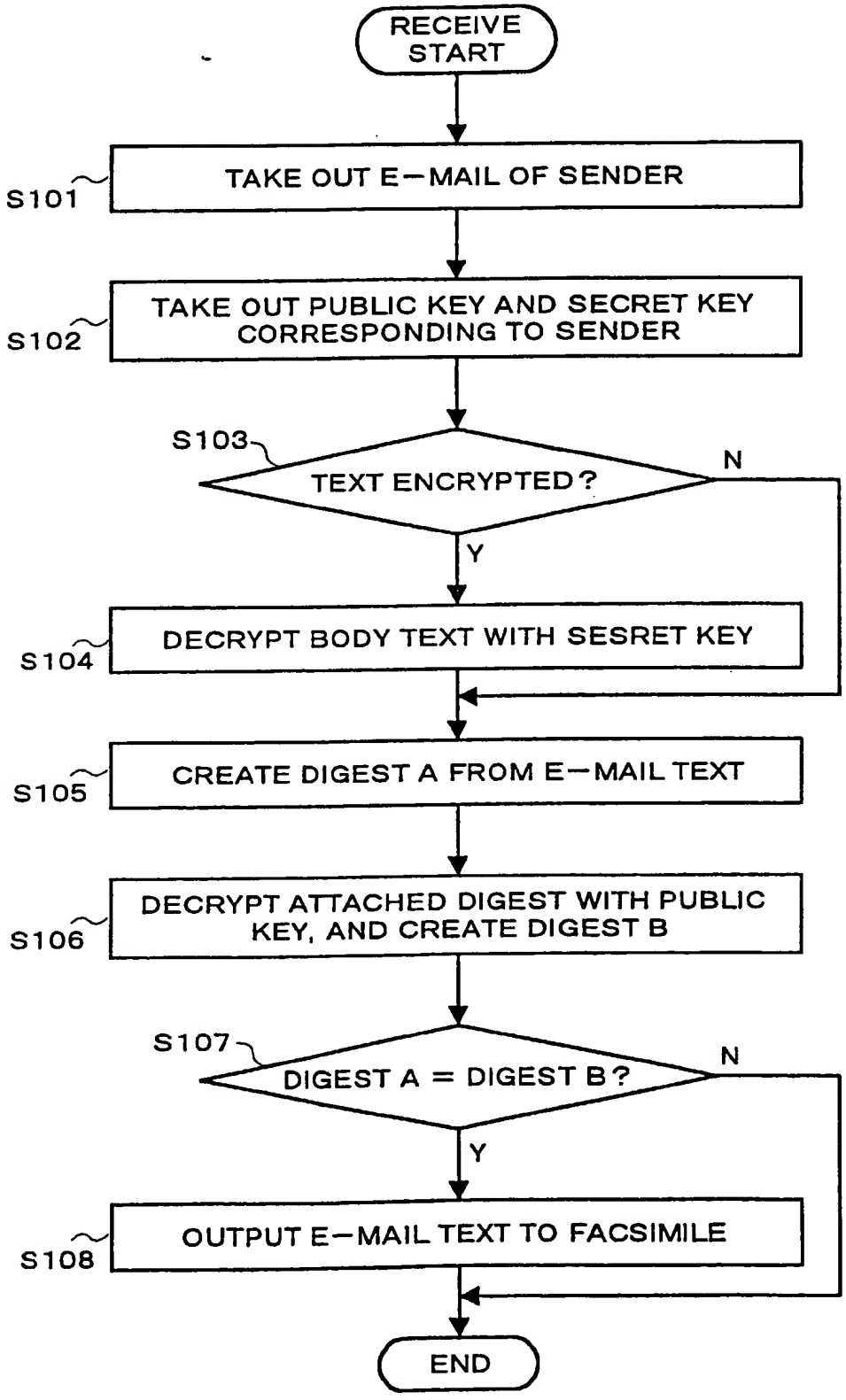


FIG. 19


RECEIVE START
S101
TAKE OUT E-MAIL OF SENDER
S102
TAKE OUT PUBLIC KEY AND SECRET KEY CORRESPONDING TO SENDER
S103
TEXT ENCRYPTED?
N
Y
S104
DECRYPT BODY TEXT WITH SESRET KEY
S105
CREATE DIGEST A FROM E-MAIL TEXT
S106
DECRYPT ATTACHED DIGEST WITH PUBLIC KEY, AND CREATE DIGEST B
S107
DIGEST A = DIGEST B?
N
Y
S108
OUTPUT E-MAIL TEXT TO FACSIMILE
END

INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP97/00695

A. CLASSIFICATION OF SUBJECT MATTER
Int. Cl^6 H04N1/32, H04L12/54
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED
Minimum documentation searched (classification system followed by classification symbols)
Int. Cl^6 H04N1/32-1/36, 1/42-1/44, H04L9/00-9/38, 12/54, G09C1/00-5/00

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
Jitsuyo Shinan Koho 1926 - 1996
Kokai Jitsuyo Shinan Koho 1971 - 1996

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	JP, 05-268450, A (Fuji Xerox Co., Ltd.), October 15, 1993 (15. 10. 93)(Family: none)	1 - 18
Y	JP, 04-265040, A (Fuji Xerox Co., Ltd.), September 21, 1992 (21. 09. 92)(Family: none)	1 - 18
Y	JP, 04-280140, A (Canon Inc.), October 6, 1992 (06. 10. 92) & US, 5548789, A	5 - 7
Y	JP, 04-154340, A (NEC Corp.), May 27, 1992 (27. 05. 92)(Family: none)	12 - 15
Y	JP, 55-34520, A (Fujitsu Ltd.), March 11, 1980 (11. 03. 80)(Family: none)	16 - 18
Y	D.W. Davies, and another, "Network Security (in Japanese)" translated by Tadahiro Kamizono (Tokyo) Nikkei McGraw-Hill, Inc., 1985, p. 239-241	18

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

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"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
May 30, 1997 (30. 05. 97)	June 10, 1997 (10. 06. 97)
Name and mailing address of the ISA/ Japanese Patent Office Facsimile No.	Authorized officer Telephone No.

Form PCT/ISA/210 (second sheet) (July 1992)